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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/797,103 | 03/11/2004 | Takahiro Saito | Q79127 | 4570 |
| 23373 | 7590 | 01/26/2006 | EXAMINER | |
| SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037 | | | BARNEY, SETH E | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 3752 | |

DATE MAILED: 01/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|--------------------------------------|-------------------------------------|--|
| Office Action Summary | Application No. 10/797,103 | Applicant(s) SAITO ET AL. | |
| | Examiner Seth Barney | Art Unit 3752 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
4a) Of the above claim(s) 4, 5, 7 and 8 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6 and 10 is/are allowed.
- 6) ☒ Claim(s) 1-3 and 9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “inlet having a diameter that is slightly greater than the diameter of a flat bottom face of the valve body, the flat bottom face being positioned within the inlet” must be shown or the feature(s) canceled from the claim(s). Although the specification text does disclose the inlet having a diameter slightly greater than the diameter of the flat bottom face, this feature is a significant limitation of the claim and needs to be included in the drawings as well. No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1, 2, 3, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,769,625 to Peterson Jr. in view of Japanese Patent No. JP359128968A to Ono.

Regarding claims 1 and 9, Peterson, Jr. discloses a fuel injection valve having:

-a valve seat face (134a) for allowing a valve body (126a) to be seated thereon when the valve body is closed.

-an injection port (135) formed on a downstream side of the valve seat face. See Figure 2A and 2B.

-a nozzle plate (10) connected to the valve seat member and disposed on a downstream side of the injection port, the nozzle plate being formed with a plurality of nozzle holes (142), the nozzle holes disposed radially outwardly with respect to the injection port, a fuel passage (146) having a cross section substantially perpendicular to an axis of the injection port, the cross section of the fuel passage having a diameter which is substantially gradually increased. See Figures 2A and 2B.

Peterson does not disclose a flat bottom face of the valve body, comprising a ball portion, having a diameter smaller than the inlet such that the valve body is positioned within the inlet when the valve body is closed. Ono discloses a fuel injector having a valve body, comprising a ball portion, with a flat bottom face that is positioned within an inlet. See the Figures. It would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute the valve body of Peterson with the valve body of Ono in order to provide a more effective fuel injector.

Regarding claim 2, the fuel passage is shaped as a cone having a diameter that gradually and continuously increases away from the outlet of the injection port. See Figures 2A and 2B.

Regarding claim 3, the fuel passage is shaped into a frustum of the cone. See Figures 2A and 2B.

Allowable Subject Matter

5. Claims 6 and 10 are allowed.

Response to Arguments

6. Applicant's arguments filed September 30, 2005, regarding the drawing objections, have been fully considered but they are not persuasive. As aforementioned, the limitation of the inlet having a diameter slightly greater than the diameter of the flat bottom face is significant and should be shown in the drawings.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent No. 4,511,082 to Ballik et al. discloses a fuel injector having a ball valve with a flat bottom face. U.S. Patent No. 5,738,284 to Gruendl et al. discloses a fuel injector having a ball valve with a flat bottom face.

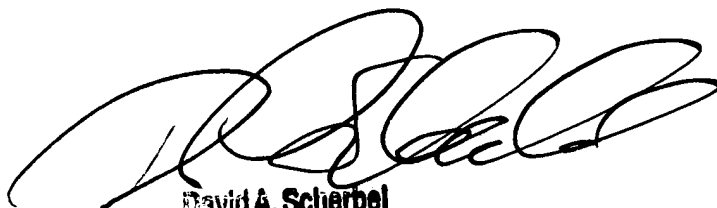
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seth Barney whose telephone number is (571)272-4896. The examiner can normally be reached on 7:30am-5:00pm (Mon-Fri), first Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Scherbel can be reached on (571)272-4919. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Seth Barney
Examiner
Art Unit 3752

sb



David A. Scherbel
Supervisory Patent Examiner
Group 3700